

1. Some computer systems do not provide a privileged mode of operation in hardware. Is it possible to construct a secure operating system for these computers? Give arguments both that it is and that it is not possible. (Question 2.6 in your book).
2. What are the five major activities of an operating system in regard to process management? (Question 3.1 in your book).
3. MS-DOS provided no means of concurrent processing. Discuss three major complications that concurrent processing adds to an operating system. (Question 4.1 in your book).
4. A CPU-scheduling algorithm determines an order for the execution of its scheduled processes. Given n processes to be scheduled on one processor, how many different schedules are possible? Give a formula in terms of n . (Question 6.1 in your book).
5. Define the difference between preemptive and non-preemptive scheduling. State why strict non-preemptive scheduling is unlikely to be used in a computer center. (Question 6.2 in your book).

Consider the following set of processes, with the length of the CPU-burst time given in milliseconds (Question 6.3 in your book with different numbers):

<u>Process</u>	<u>Burst Time</u>	<u>Priority</u>
P1	9	2
P2	2	5
P3	4	4
P4	3	1
P5	7	3

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

6. Draw Gantt chars illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum size 2) scheduling.
7. What is the turnaround time and waiting time for each process for each algorithm in question 6?
8. What is the average waiting time for each algorithm in question 6? Which algorithm has the minimal average waiting time? Why?
9. What is the meaning of the term *busy waiting*? What other kinds of waiting are there in an operating system? Can busy waiting be avoided altogether? Explain your answer. (Question 7.1 in your book).
10. Show that if the **wait** and **signal** operations are not executed atomically, then mutual exclusion may be violated. (Question 7.7 in your book).